Program Change Request

New Program Proposal

Date Submitted: 09/16/26 1:57 pm

Viewing: GIS-UC2 : Geomatics Undergraduate Certificate

Last edit: 11/02/26 3:55 pm

Changes proposed by: Reda Amer (rmapg4)

Initiator:	Name:	Reda Amer	Phone: 3145164838
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Program Code	GIS-UC2		

In Workflow

1. **S004575 Chair**
2. **Curricular Alignment Check**
3. **Academic Affairs Program Preapproval**
4. **SA_S Assoc Dean**
5. **SA_S Dean**
6. **Senate C&I**
7. **Senate C&I Editing**
8. **FacultySenate**
9. Academic Affairs
10. Registrar Programs

Approval Path

1. 09/22/26 10:01 am Betsy Sampson (sampsone): Approved for S004575 Chair
2. 10/08/26 1:51 pm Keeta Holmes (holmeskm): Approved for Curricular Alignment Check
3. 10/12/26 8:48 am Betsy Sampson (sampsone): Approved for Academic Affairs Program Preapproval
4. 11/02/26 3:57 pm Wendy Olivas

(olivasw): Approved for SA_S Assoc Dean
5. 11/02/26 3:57 pm Wendy Olivas (olivasw): Approved for SA_S Dean
6. 11/09/26 3:04 pm Ho Kim (kimho): Approved for Senate C&I
7. 11/10/26 10:46 am Betsy Sampson (sampsone): Approved for Senate C&I Editing

To be completed by Academic Affairs

Title	Geomatics Undergraduate Certificate
Program Type	Certificate
College/School	
Department	
Academic Level	Undergraduate
CIP Code	45.0702 - 45.0702
Effective CAT	2026-27

Program Requirements and Description as it will appear in the bulletin.

The Undergraduate Certificate in Geomatics provides a gateway to the growing, high-demand field of geospatial technology. The program introduces students to modern tools and techniques used to collect, measure, map, and analyze location-based information. Students develop practical skills in satellite positioning using Global Navigation Satellite Systems (GNSS), surveying, photogrammetry and drone mapping, geodesy (understanding the Earth's shape and how locations are measured), remote sensing, and geospatial data analysis. These skills can be applied to real-world challenges in geospatial intelligence (GEOINT), environmental monitoring, urban planning, transportation, infrastructure development, disaster response, natural resource management, and many other fields.

This 15-credit interdisciplinary certificate welcomes students from all majors and academic departments, as well as professionals seeking to develop new skills or advance their careers. The program emphasizes hands-on learning through field activities, applied projects, and training with industry-standard technologies. By combining scientific foundations with practical training, the certificate equips students and professionals with valuable skills for careers in the growing geospatial workforce. GIS 1000 (Exploring Geospatial Thinking and Technology) is required as a

prerequisite to the program. Note that some of the 4000-level elective courses have additional prerequisites, so please consult an advisor for more information.

Course Number	Title	Hours
Core Courses		
GIS 3320	Fundamentals of Geodesy	3
GIS 3321	Global Navigation Satellite Systems (GNSS)	3
GIS 3322	Photogrammetry and Drone Mapping	3
Elective Courses		**6**
Choose two of the following courses:		
GIS 4323	Applied Geomatics and Spatial Data Integration	
GIS 4325	Geospatial Artificial Intelligence (GeoAI) and Spatial Analytics	
GIS 4326	Advanced Surveying and Professional Practice	
PHYSICS 4358	Introduction to Global Geodynamics	
Total Hours		15

If other departments are affected by this proposal, please secure "sign-offs" and indicate for each department the following:

Department	Contact Person	Phone #	Objections
Physics	Erika Gibb	x5081	No

Program Learning Outcomes

Learning Outcomes
Explain and apply core geodetic concepts, including ellipsoids, datums, coordinate systems, and Earth models, and to interpret and transform spatial data
Operate GNSS equipment, collect field measurements, and evaluate positional accuracy using standard correction techniques
Design basic UAS mapping missions and produce georeferenced imagery products (Orthomosaics, point clouds) using photogrammetric workflows.
Apply introductory remote sensing or GeoAI techniques (e.g., basic classification or clustering) to extract information from imagery or spatial datasets using industry tools.

Attachments

This program will be developed with the intention of delivery in the following delivery modes (choose all that apply)

Face to face
Hybrid (27%-49% of program coursework offered online)
UMSL Online (50-74% of program coursework offered online)
Missouri Online (75% or more of program coursework offered online and participates in Missouri Online)

Justification for request:

Unlike most undergraduate geospatial programs that emphasize GIS or cartography, UMSL uniquely foregrounds geodesy and positioning sciences as the foundational layer for modern geomatics. This credential supports applications in:

- National security and geospatial intelligence
- Land development and cadastral systems
- Smart cities and infrastructure
- Emergency response and climate resilience
- Environmental and urban monitoring

UMSL will fill a national void by emphasizing geodesy as the foundational science of geospatial understanding—setting this program apart from similar offerings across the country.

Program Reviewer Comments

Key: 761